Safe Operation for Large Vehicles Initiative
SOLVI

Presented on behalf of the SOLVI Project Team
by
Michael L. Sena
Project Manager
The Partners

Appello
Michael L. Sena Consulting AB
Navigation Technologies AB (Navteq)
Scania CV AB
Swedish Road Administration
Triona
Volvo Technology Corporation

Project Start: 1 October 2005
Project Finish: 31 March 2008
Budget: 32 MSEK (€ 3.5 million)
The Presentation

The Problem
The SOLVI Premise
Looking for Solutions
The Project
  Collect Data
  Build Applications
  Deliver Data to the Applications
The Participants
What we are doing
Expected Results and Schedule
The Problem

Heavy truck traffic has increased by 60% in Sweden during the past 20 years, and now comprises 8% of road traffic... but trucks are involved in 22% of traffic-related deaths in Sweden.

10% of the 40,000 deaths on Western European roads involve heavy trucks.

More heavy trucks on the roads is a worldwide phenomenon due to the logistics solutions developed over the past decade.

The top of a truck is given a shaving because of a mismatch between the height of the truck and the clearance of the overpass.
The SOLVI Premise

Information that could help heavy vehicle drivers perform more safely and effectively is not available to them in the vehicle when they need it. It is just starting to be collected.

Applications that could use this improved information are now possible using advanced driver assistance technologies, navigation systems and communications technologies.
SOLVI: Looking for part of the solution

Integrate static and dynamic information from both public and private sources in a detailed truck attribute database.

Help to improve driver safety performance—perhaps in some cases without the driver’s knowledge—with ADAS.

Deliver both static and dynamic data directly to the vehicle.

Detailed road slope and curvature information are two of the most important attributes for both safety and performance applications.
Sample Truck Attributes: Legal Restrictions

<table>
<thead>
<tr>
<th>Attribute Name</th>
<th>Relevant for</th>
<th></th>
<th>Priority (1 – 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>light commercial vehicles</td>
<td>heavy trucks</td>
<td></td>
</tr>
<tr>
<td>All trucks forbidden</td>
<td>X</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>No left turn for trucks</td>
<td>X</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>No right turn for trucks</td>
<td>X</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>No U-turn for trucks</td>
<td>X</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Trailer forbidden</td>
<td>X</td>
<td>X</td>
<td>2</td>
</tr>
</tbody>
</table>
Sample Truck Attributes: Physical Restrictions

<table>
<thead>
<tr>
<th>Attribute Name</th>
<th>Relevant for</th>
<th>Priority (1 – 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Light commercial vehicles</td>
<td>Heavy trucks</td>
</tr>
<tr>
<td>Height Restriction</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Weight Restriction</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Width Restriction</td>
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<td></td>
</tr>
<tr>
<td>Length Restriction</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>
SOLVI – The Project

Navteq and SRA will focus on the collection, processing and quality assurance of road information for safety and performance improvements in heavy truck operations.

Triona and Appello will focus on the delivery and dynamic updating of the data. Scania and Volvo will demonstrate the use of these safety attributes in Advanced Driver Assistance Systems (ADAS) and navigation system applications for heavy trucks developed within the project.

Michael L. Sena is responsible for project management.
SOLVI – The Project Area

- Älvsjö
- ITS World Congress 2009
- Södertälje
- Scania
- E20
- E4
- R45
- Highway Project Arena
- Göteborg
- Volvo Trucks
- Lindholmen
ADASIS Architecture

SOLVI will use the ADASIS Architecture

Electronic Horizon: List of points corresponding to the road path in front of the vehicle up to a determined distance

- Vehicle Position
- Network Topology
- Attributes
Volvo - Vehicle Information Management

Static Data - Traditional navigation map data + ADAS and truck-specific data.

Dynamic Data - Variable- and semi static data (like variable speed signs and weather conditions).

In vehicle e-horizon distribution on CAN using ADASIS architecture--extended for truck attributes and dynamic data.

Handling and using e-horizon content

Transmission of dynamic data via GPRS through Volvo telematics gateway (Dynafleet) to navigation system and e-horizon provider.
Using Truck Attributes in the Volvo Application

Potential gain of performance for Cruise Control, gear change, drivetrain, brake blending, auxillary systems, etc.

Identify requirements for different levels of safety- and cost reduction benefits:
- Coverage
- Range
- Accuracy
- Resolution
- Integrity
- Reliability
Scania – ADAS for Longitudinal Control

Set initial requirements for quality of slope data to be used for longitudinal control.
• Spatial resolution
• Error tolerance

Implement experimental map based longitudinal control.
Investigate slope data quality requirements for other applications e.g. auxiliary control.
Verify map interface for applications using slope data.
SOLVI – Expected Results

Identify the safety and performance benefits that would accrue from integrating the road attributes and using ADAS in truck operations.

Help to determine how a European truck attribute road database can best be created, and how ADAS can apply these attributes to improve the safe performance of commercial vehicles, particularly heavy trucks.

Goals of IVSS met by SOLVI

Road Safety
• Fewer truck-related accidents and deaths

Economic Growth
• Reduced fuel usage
• More effective routing

Technology Development
• Advanced systems for truck safety and performance improvements
Schedule

- Truck Attributes Horizontal Project
- Dynamic Data Horizontal Project
- ADAS Horizontal Project
- ADASIS for Braking
- ADASIS for Longitudinal Control
- Safe Navigation Static and Dynamic Data
- Project Management
- Project Report

Timeline:
- October 2005
- 2006
- 2007
- March 2008
Thank you

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